



TITLE:

第Ⅱ部 資料編：中村要とR. スコフィールド往復書簡

AUTHOR(S):

CITATION:

第Ⅱ部 資料編：中村要とR. スコフィールド往復書簡. 第7回天文台アーカイブプロジェクト報告会集録 2016, 7: 23-73

ISSUE DATE:

2016-11

URL:

<http://hdl.handle.net/2433/217392>

RIGHT:

中村要と R.スコフィールドの往復書簡

(1) 1924 年 4 月 11 日 中村からスコフィールドへ (手書き)

Dear sir

Excuse me my poor English. I wish to know some constants about your telescope. Please write me maker, aperture, focal length, power of eyepieces and its bin and maker.

I know now 3 and 2 inch Ottaway telescope and moreover a 6 1/2" mirror by Rev. Ellison is expected to reach soon. I must make tube and wish to mount it side by side with 3" telescope. This is the reason why I have selected focus of 45". Dr. Ellison have written something about my mirror in E.M. no.3074. I have tested Heyde's Huyghenian eyepiece with 10" Brashear reflector (F/5.4) and they were found to be decidedly unsuitable for short focus reflector such as 10". They reduces remarkable spherical aberration also with slight faulscour. I have seen a 4 1/2" mirror at Mr. Morishita's. I wish to know maker of tube and eyepieces.

I have obtained any 3 and 2" objective by Ottaway in 1922, and designed and constructed all the mounting and tube. My regular observation is to observe long period variable as a member of AAVSO and to make celestial photographs with 10" reflector.

Yours truly,

K. Nakamura

(2) 1924 年 4 月 19 日 スコフィールドから中村へ

Dear Mr. Nakamura:

Your letter of the 11th inst. Only reached me at my house yesterday (Good Friday), and I hasten to reply to same.

I have two reflector on the same mount, altazimuth with hand slow motions. One is by Calver, 8 1/2 inch, 86 inch focus, with which I use four e.p. powers 75, 147, 236 and 310, also the same with Barlow Lens by which I obtain 118, 243, 394 and 525 respectively. The first three e.p. are Huyghenian, and the highest power seems to be a cemented achromatic. I have no trouble at all on account of chromatic aberration, which is probably due to the very long focus. The other reflector is by Irving, unsilvered, which I use for solar observations, powers usually 30 and 62.

The 4 1/2" reflector which you saw at Mr. Morishita's is probably the one I sold him a short while ago. I bought it from C. Baker. The mirror is by Ellison, and probably the

e.p., which are Huyghenian, also made bay him.

I noticed the article in R.M. about your 4 1/2" mirror. These mirrors with great relative focus are I understand very hard do make.

I have been so busy with my new code that I have unfortunately been an unable to devote the time to observation that I would like. I am principally in sunspot and planetary observation. I sent Prof. Pickering some drawings of Mars last opposition, and intend to start to work very shortly again. I should be very glad to co-operate with you in sunspot observations if you will instruct me what you wish done. I also has a solar spectroscope.

I am very glad indeed to hear from you, and should be most happy to see you sometime when you come to Kobe.

Yours sincerely,

(3) 1924 年 5 月 31 日 中村よりスコフィールドへ (手書き)

Dear sir

I go to Kobe to receive mirrors on June 2, and I wish to call on you in the afternoon. I will be very happy at that time to see your telescopes in the evening when it were clear.

Yours truly,

K. Nakamura

(4) 1924 年 6 月 3 日 スコフィールドより中村へ

My dear Mr. Nakamura:

As your postal of the 31st only reached me this moring, I regret that I was somewhat unprepared for your kind visit last night, and hope you can find time some Sunday, or holiday to spend the day with me, when we can talk of our mutually interesting subject more leisurely. If you will let me know say a couple of days beforehand, I shall be waiting for you.

Hoping to see you agein at an early date, and with kind regards to yourself and Mr. Otsubo, I am,

Yours sincerely,

RS:SF.

(5) 1924 年 7 月 3 日 中村よりスコフィールドへ

Dear sir,

I wish to call on you on July 13 at about 3h p.m.. Will you be at home or not? I will be very happy to speak on many interesting observational points and to see some stars with your telescope if it were clear. I am very interested on the performance of your Calver which is only one in Japan. The mounting of my Ellison 6.5" mirror has almost completed. The testing in the dark room and some actual observation proved its fine figure.

Yours truly

K. Nakamura

(6) 1924 年 7 月 4 日 スコフィールドより中村へ

My dear Mr. Nakamura:

I am receipt of your letter of yesterday, and shall be very glad to see you on the 13th (Sunday).

I am resilvering the mirror in the meantime. I have been trying to get some pitch to cement wood block to back of mirror. If you have a few ozs. to spare, would you mind sending to me.

Looking forward to the pleasure of meeting you again on the above date,

I am,

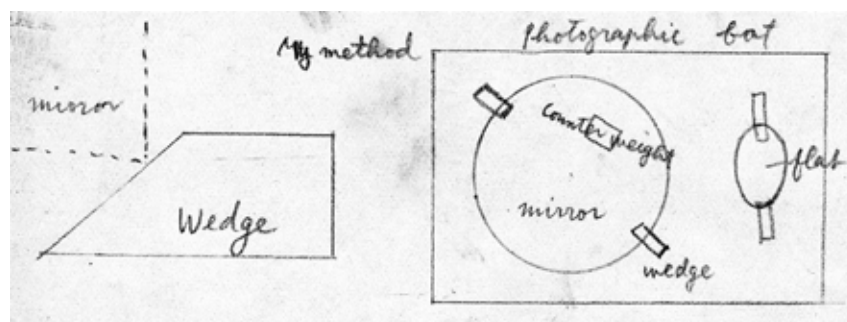
Yours sincerely,

RS/YO:

(7) 1924 年 7 月 5 日 中村よりスコフィールドへ

Dear Mr. Schofield,

Thank you for your kind permission for my visit. As for silvering I always use to wedges to support mirror during silvering process, and I have no pitch now.



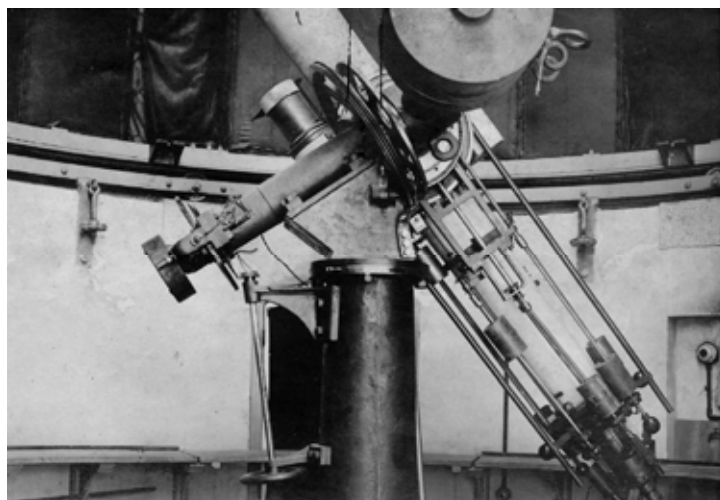
(本文の地に

直書き)

The defect of silver at the extreme edge of the mirror where wooden wedge touched does no harm as far as I know.

Yours sincerely,

K. Nakamura



同封写真の裏書：7" Refractor of Kyoto University Observatory,

7" O.G by Carl Zeiss.

Mounting by Sartorius of Gottingen, Eyepieces by Steinheil.

Camera: Zeiss Astropetzval of 6 cm aperture.

7" objective prism by Steinheil

(8) 1924 年 7 月 9 日 スコフィールドより中村へ

My dear Mr. Nakamura:

I am in receipt of your letter of the 5th enclosing photograph of your 7" Steinheil, which is a magnificent instrument by a celebrated maker. I thank you for your kind instructions regarding your method of using wedges, but am afraid I shall not be able to resilver the mirror in time for your visit. I have, however, polished it up, so that the reflectivity is probably about 75%.

My old and esteemed friend Mr. D. Kennedy, with whom you are doubtless well acquainted, will join us on Sunday afternoon, so that I am looking forward to your visit with great pleasure.

I have been up between 2/4 a.m. for the last few days observing Mars. The seeing has been fairly good (about 7), and have used X235, sometimes X315 on the 8 1/2". If you care to stay at my house on Sunday night we can observe Mars in the early morning. I should greatly like to have your opinion on the definition of the Calver mirror as

compared with your Brashear.

One fault with all the reflecting telescopes I have had is that the draw tube does not fit dead tight, so that when a heavy e.p. or battery of e.p.'s on a nosepiece is used, the drawtube sags down, slightly decentralizing the optical axis.

Unfortunately owing to my new code, I have not been able to devote as much time as I would like to our beautiful science, but my work is almost over now, and in future I intend devoting more time to it.

Looking forward with great pleasure to your visit next Sunday,

I am,

Yours sincerely,

(9) 1924 年 7 月 10 日 中村からスコフィールドへ (手書き)

Dear sir,

Thank you for your kind letter of 9th. I remember name of Mr. D. Kennedy through Tenkai but I never met him.

I have commenced regular observation of Mars from this month. On the 7th I noticed remarkable inequality of brilliancy of polar cap when the standard seeing was 9 with 7" 390X. On the 9th I was astonished with a sudden breakage of polar cap into two distinct parts (seeing 8).



If it were fine I will be very happy to stay at yours on Sunday night to observe Mars with you.

Yours sincerely,

K. Nakamura

(10) 1924 年 7 月 17 日 中村よりスコフィールドへ

Dear sir,

Thank you for your kindness during my stay. My purpose was fully satisfied, I was astonished with the excellent image obtained by Calver mirror. I can say it is the best telescope for planetary observation in Japan. On the another day the shadow and zonal testings will prove how much they are excellent. The poralizing (ママ) eyepiece and spectroscope which you so kindly lent to me was found to be useful for 7" refractor. It

shall be in use within a week after completion of a adapter.

Yours truly,

K. Nakamura

(11) 1924 年 7 月 18 日 スコフィールドより中村へ

My dear Nakamura-San:

Many thanks for your kind letter of yesterday. It was very encouraging to hear you speak so well of the Calver mirror, which seems to be a good example of that great amateur's handiwork. The slight under-correction in the central zone may be due to the substitution of prism for plane.

I have not had a chance to make further sketches of Mars, as we have had 2 rainy and dark days, and when I has been clear the seeing has been very bad, probably 3 on the standard scale. I could still make out the rift in the S. polar cap and the brightness of Hellas.

I am very interested to learn that you will soon be making observations of solar prominences. Some I have seen were very beautiful. I am afraid you will have to reduce the aperture to 3", which is the size intended for use with that spectroscope, otherwise the spectrum will be drowned.

I shall be glad to see you again, and talk over our mutually interesting subject.

With kind regards, I remain,

Yours sincerely,

P.S. Mr. Kenedy called while we were out. I got a postcard saying he was sorry not to have an opportunity of meeting you.

(12) 1924 年 8 月 1 日 スコフィールドより中村へ

My dear Mr. Nakamura:-

I have re-silvered the 8 1/2" mirror, with considerable improvement in brightness of image. Seeing has been very good here lately.

On the 28th I noticed some yellowish spots on S. polar cap, and this morning a very bright round patch on its border. Solis Lacus and Nectar were seen very clearly this morning; very dark. I enclose herewith rough sketches, and am interested to learn how they compare with your observations.

Yours sincerely,

RS/YO:

(13) 1924 年 8 月 2 日 中村よりスコフィールドへ

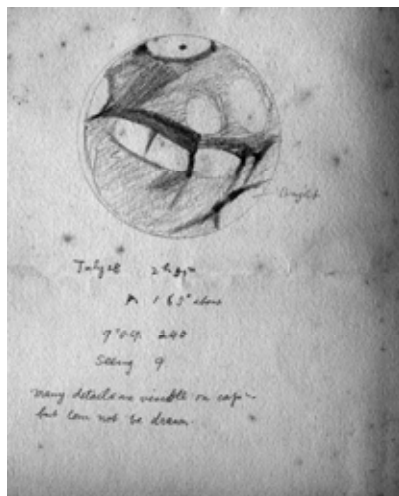
Dear sir,

Your letter of August 2 was quite interesting to me. I have observed Mars on 28 and on this morning. I feel great difficulty in observing planetary color in the refractor. I must express optical power of our 7" is quite below your reflector. The resolution and definition of Calver mirror on planet is none comparable. On the morning of July 28 I have observed doubled canal Titan easily for the first time I have experienced. Some days before doubling of Lunar run on Eratosthenes was observed.

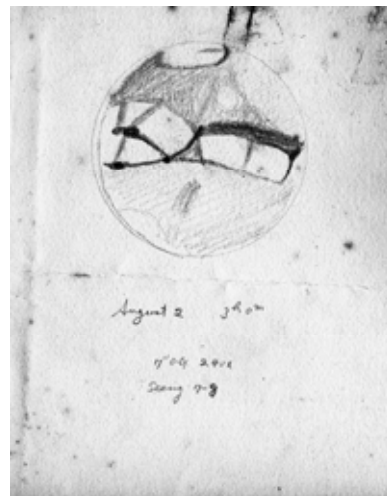
My reflector is ready for observation. On July 28 it was compared with 7", it showed same and canal was very definitely seen. Huyghenian eyepieces is quite poor on short focus reflector, spoils definition badly. Our 10" is ready for setting in a few days and you may come on the second or third Sunday, or on any day you may like.

Yours truly,

K. Nakamura



同封スケッチ 7月28日



8月2日

(13) 1924 年 8 月 6 日 スコフィールドより中村へ

Dear Mr. Nakamura :

Many thanks for your letter of the 2nd, enclosing two interesting sketches. The doubling of Titan is a notable observation, and I must congratulate you upon your excellent eyesight, which is far better than mine.

I regret to note the chromatic trouble with Huyghenian e.p. on your new 6 1/2" Ellison. It just occurs to me that possibly a Barlow lens might correct it somewhat by drawing out the cone of rays. I have a spare one here somewhere if you need it (made by Watson). There is an interesting paragraph on this subject in Bell's "The Telescope," which gives the theoretical limit for relative foci for good performance, and even at F8 definition falls off rapidly from centre of field.

I have been making more use of my 310X e.p. lately (the one which you said was a Steinheil monocentric). When seeing is good this e.p. gives the sharpest definition.

I thank you for your kind invitation, and should very much like to observe Mars through your 10".

Yours sincerely,

(14) 1924 年 8 月 9 日 中村よりスコフィールドへ

Dear sir,

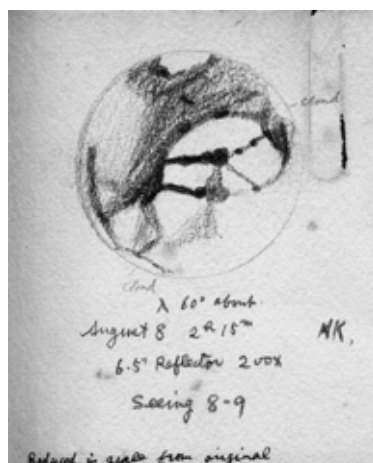
Your letter of 6th was received with thanks. As to the aberration of Huyghnian eyepiece chromatic aberration is not so trouble but awful is its remarkable undercorrection which completely break down the sharpness of image. After some considerrations (ママ) I have placed a single double con-cave lens infront of eyepiece. The result was good. By proper adjustment of separation spherical aberration had almost disappeared as well as chromatic aberration. This agrees well with your opinion. Probably Barlow would answer better. I am now employing successfully with Ottoway's 8mm. I have enclosed one of drawing made with this.

7" was found to be too large for Hilger spectroscope and it was attached to my 2" Ottoway which is bound to 7" temporarily. Several fine view of large eruptive prominence was obtained.

10" reflector is not mounted yet but it is sure to complete until lunar eclipse of 15th. I fear you might probably disappointed with its image because figure is much overcorrected except its brilliant image. Short focus reflector can not give correct sharp image but it is excellent for low power.

Yours sincerely,

K. Nakamura



(同封スケッチ)

(15) 1924 年 8 月 11 日 スコフィールドから中村へ

My dear Mr. Nakamura:

I am in receipt of yours of the 9th and glad to learn that you have succeeded in correcting the chromatic aberration of the Huyghenian e.p. on your 6 1/2". Your drawing enclosed is very interesting and the 6 1/2" must be very good to show so many details of Solis.

Am glad to hear that you have had some good views of Solar prominences. Perhaps 2" would just be about right, as the e.p. has a magnification of x5, and larger focal image of the 6 1/2" Irving was very difficult to follow without clock. Some of these prominences are very beautiful, and gives one some idea of the immense power of the Ruler of the Solar Universe.

I shall be very glad to spend the night with you. Probably early Sept. might be a good time, and I should like to bring along my friend Mr. Kennedy.

I met our mutual friend Mr. Morishita a few days ago, and tried to keep up his interest in figuring mirrors, in which I hope he will be successful, as it will be a great boon to amateurs in Japan.

Yours sincerely,

(16) 1924 年 8 月 14 日 中村よりスコフィールドへ

Dear sir,

10" reflector was mounted on its new site yesterday. A Huyghenian eyepiece of 0.2" focus was tried. The hyperbolic (ママ) image of 10" was very much corrected with the remarkable undercorrection of Huyghenian. The image of Mars was sharp with

magnification of 270 and reveal much detail compared with 7" or 6.5". I think this is a fine result with F5 mirror and detail is not inferior to your Calver.

My recent study of canal proved Prof. Pickering's recent opinion. Broad and dense is real existence without doubt. To my eye fig. No. 3 of report 25 appears to be correct. The albedo of both side edge of a canal is different on most cases. Sometimes there is no canal where albedo differs distinctly and Lowellian observer draw linear canal there. This suggest me that the linear canal might be sometimes an illusion. Please careful on this point when Elisium region appears.

Yours truly,

K. Nakamura

A vest masses of cloud was observed since 12th southern maria of λ 30° about.

(17) 1924 年 8 月 18 日 スコフィールドより中村へ

Dear Mr. Nakamura:

I am in receipt of yours of the 14th very glad to hear that you have found a suitable e.p. for your 10". Possibly a Barlow or other concave lens might effect an improvement, as I have seen it mentioned somewhere that such lenses considerably improve the definition of reflectors of short relative focus.

I note your very interesting remarks regarding canals of Mars, and shall watch the Elysium region carefully as you suggest. The canals I saw in Solis Lacus were broad and hazy.

I have not been able too much for several days owing to bad seeing conditions, but there was a slight improvement this a.m. (about 6 on the standard scale), and I was successful in marking a sketch. To my eye there was a connecting canal between Aryn and N. end of Syrtis. I could not see the rift in the S. polar cap.

Yours sincerely,

RS:SF.

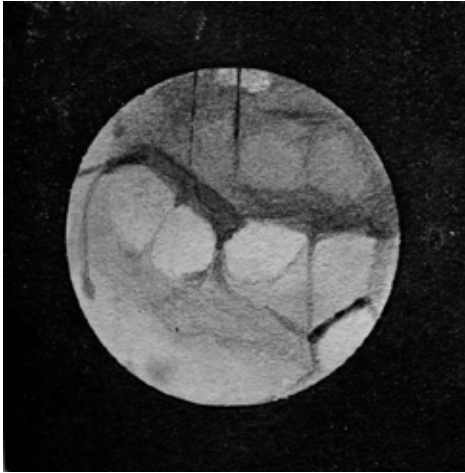
(18) 1924 年 9 月 1 日 中村よりスコフィールドへ

Dear sir,

Mars was well observed at its nearest approach on August 22 and 23. Canal Cerberus was quite easy object and was seen by many visitors with only 3". On the 30th a drawing was made. Eumenides was never seen. Enclosed drawing well represent what I have seen. I wish to see your recent one.

Yours sincerely,

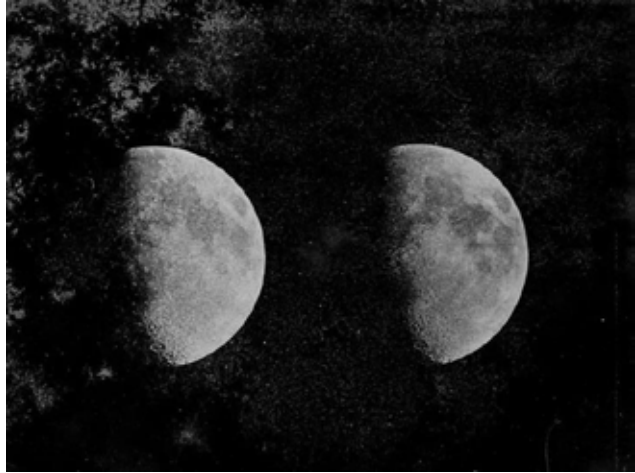
K. Nakamura



λ about 180° 24.8"

August 30, 1924 11h50m

7" O.G. 240x standard seeing 8



Photographed with 7" at its focus through
yellow filter. Exposure its 1sec

(19) 1924 年 9 月 4 日 スコフィールドより中村へ

My dear Mr. Nakamura:

Yours of the 1st enclosing beautiful drawing of Mars and photo of Moon, received with my thanks.

I enclose herewith rough sketches of August 19 and September 2, between which dates I was able to do very little work on account of business engagements and unfavourable weather. I have not had an opportunity of closing examining the Elysium region yet. Eumenides region seems to be enwrapped in mists. The rift in the S. polar cap seems to have disappeared, and the cap itself is rapidly becoming smaller.

Yours sincerely,

P.S. Mr. Morishita came round on the evening of the 2nd and made a drawing with the 8 1/2", which I suggested he forward to you, as it was rather good.

(20) 1924 年 9 月 22 日 スコフィールドより中村へ

My dear Mr. Nakamura:

Will you kindly return my Solar Spectroscope, as I intend to use it with my 2", to which I have just attached a steadying rod.

Seeing has been very bad here lately, sometimes 4-5 with aperture reduced to 5 1/2".

I have not yet had an opportunity of confirming your observations of the Elysium region yet, but shall be on the look-out.

With kind regards,

Yours sincerely,

(21) 1924 年 9 月 26 日 中村よりスコフィールドへ

Dear sir,

Your letter of Sept. 22 have duly received. The solar spectroscope was sent to your office today by parcels post registered. I was employed for prominence observation on every clear day. Large number of quite interesting and grand prominences were observed. Sometimes more than ten was recorded around the limb. As the telescope was bound to the equatorial position angle of prominence was measured. The focal length of 30" was found to be quite large enough for that spectroscope. Having frequently used out-look of spectroscope was badly tarnished.

Seeing had been very bad herealso. As it was predicted by Prof. Pickering shading of Libya seems to have commenced, Syrtis narrowed, and Moeries locus became larger. Last night Toth-Nepemthes canal was easily visible.

Yours sincerely,

K. Nakamura

(22) 1924 年 10 月 1 日 スコフィールドより中村へ

Dear Mr. Nakamura,

Many thanks for your letter of the 26th ult. Returning solar spectroscope. I am glad to hear you had such interesting views with it.

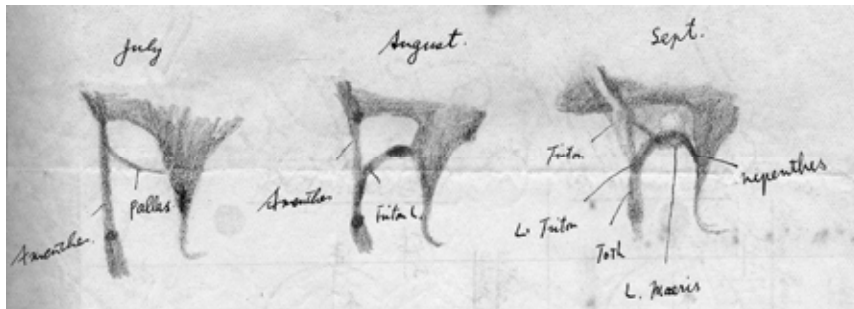
Seeing has been particularly bad here as a rule lately, and sometimes I have had to cut the aperture down to 4 1/2". Last night, however, was an exception, about 8 on standard scale, and I could use x 310 on full 8 1/2" quite easily. I enclose herewith a coloured sketch, which I hope will interest you, and shall be glad to learn how it compares with your observations on the same evening. Cerberus, Trivium, Propontis and Titan were very conspicuous. Green colour of S. maria very marked. Brownish haze on terminator. S. polar cap seems to be disappearing rapidly. I suspected a small rift near the E edge on the previous evening, but was not able to confirm this.

With kind regards, I am,
Yours sincerely,

(23) 1924 年 10 月 2 日 中村よりスコフィールドへ

Dear sir,

Thank you for your beautiful color drawing. I have observed there on the same night. Since the seeing not very good, magnification of only 150 had been used. Cerberus and two lake were quite conspicuous and was visible with 3" telescope. The polar region seems to have covered with cloud. This seems to have commenced between Sept. 19 and 25. The bright small cap is seen through cloud. Two enclosed drawings will be interest to you. Interesting change of Libya region was carefully studied.

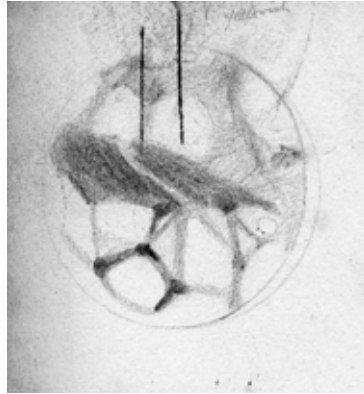


(本文の地に直書き)

1. Syrtis narrowed gradually.
2. Change of L. Moeris.
3. Drift fo Amenthes to right.
4. Shading of Libya.
5. Gradual development of Toth-Nepenthes and fading of Amenthes.
6. Fading of Pallas between Sept. 25 to 30 and development of Triton.

As you will see in my drawing I see canal broader than you and seems to nearly equal to Pickering or Phillips. I draw canal which just appears to my eye comparing canal by canal and canal to marina.

Yours sincerely,



同封スケッチ裏書 Sept. 30 10h40m λ 242° D Δ +2°

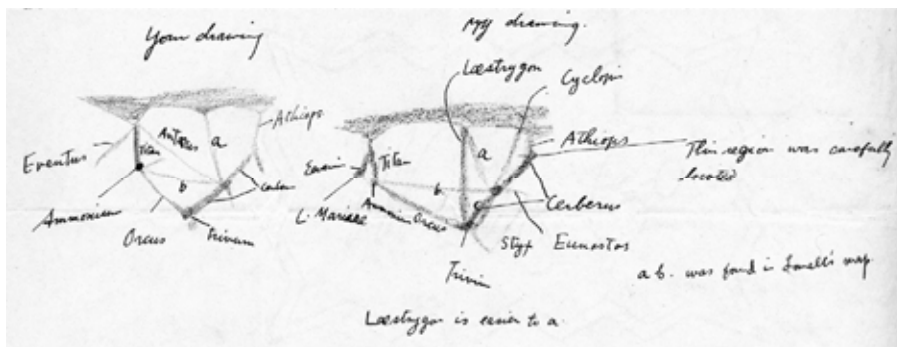
7" Zeiss O.G 240X seeing 8 yellow filter

(24) 1924 年 10 月 3 日 中村よりスコフィールドへ

Dear sir,

Last night a drawing was made with 7" under good seeing condition for the purpose of comparing to your drawing. The central longitude being nearly equal.

As I was little suspicious to the identity of Propontis extreme care had been paid for Elisium region. My identification is as follows.

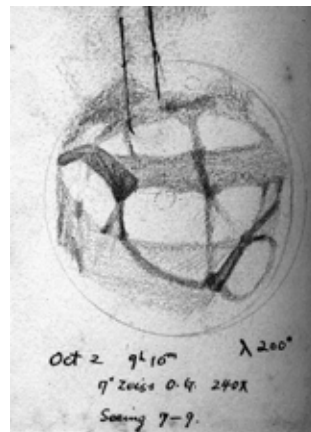


(本文の地に直書き)

Please see my drawing of Sept. 30 which might assist my identification. Canal "Co" seems to be Cerberus, it is divergent double canal as it was shown in standard map. My Trivium can not be Propontis. Propontis locate at the same longitude in high northern latitude to Titan and it can not be seen at λ 240° so well. Your drawing is almost correct but requires little correction to the location of marking. The canal observed by you is quite correct. I have some doubt about my identification, what is your opinion?

Yours faithfully

K. Nakamura



(同封スケッチ2枚)

(25) 1924 年 10 月 4 日 スコフィールドより中村へ

Dear Mr. Nakamura:

Many thanks for yours of the 2nd enclosing 2 sketches. I am very interested in your remarks about Libya region. On the 25th Sept. (one of the very few nights of good seeing) I made a sketch, a copy of which I enclose. I was wondering at the great change, as I saw Pallas very clearly on August 18th *(I think I sent you a copy of my sketch). Amenthen is faint but still discernible. Your work and careful study of this region is of great value and interest, and I think you ought to write a special article in "Popular Astronomy."

The cause of these great changes is a mystery. We have nothing analogous on our earth.

Regarding width of canals, I am never absolutely sure, as sometimes a canal that appears broad and diffused will, with a very slight change in focus or during a moment of exceptionally steady air, become distinctly darker and narrower. Besides, I believe a reflector shows them up more sharply than a refractor. I, of course, do not see them anywhere near as fine and clear cut as the Italian observers, but this again may be due to larger aperture and very steady air. On the whole I found the seeing this opposition not as good as last, when I was able to use over x 500 at times. This year I have never been able to use above x 310.

I have had some interesting views of solar prominences with my 2" (30" focus-same as yours). The focal image enlarged to 35 m/m by the x 5 e.p. is just about right, and approximate measurements can be taken, 1 m/m being about 25,000 miles high. On the 2nd I saw four beautiful prominences on E. limb, one just like a rosebud about 75,000 miles in height, and another slightly longer just like a waterspout. This is a very interesting branch of work. I was never able to get satisfactory results with the 8 1/2",

probably owing to the spectrum being drowned and the difficulty of keeping the limb of the large focal image exactly on the slit.

”Not seen on following night” (追記) .

I tried it on the 6 1/2” with only very slight improvement, so decided to attach a steadying rod to my 2”, and this recently arrived from London. Even with the 2” the slit must be very carefully opened. With only an altazimuth stand it requires considerable patience, but the views are surpassingly beautiful.

I should like to visit you next Saturday or Sunday, if convenient to you.

With kind regards,

Yours sincerely,

(26) 1924 年 10 月 4 日 中村よりスコフィールドへ

Dear sir,

Your letter of 4th safely reached. I am very glad to hear your visit.

The result of my prominence observation was recently studied and showed some interesting fact. The northern hemisphere is quite rich in prominence, 34 out of 45 were in northern latitude. The distribution of latitude was interesting 40° – 50° and equatorial zone seems to be richest.

Latitude	no. observed
0° – 10°	9
10 – 20	1
20 – 30	5
30 – 40	8
40 – 50	9
50 – 60	6
60 – 70	4
70 – 80	1
80 – 90	3

As you have seen in “The Heaven” I have published Zonal measure of 4 parabolic mirror, but unfortunately lack of yours. Calver’s 8.5” is fine one but quality of Irving mirror is unknown. It is only one mirror of that maker in Japan and requires zonal testing to decide its precise quality. The measure will be interesting as it determines Mr.

Irving's hand. If you will kindly brought that mirror (mirror only is sufficient) on the day I hope to get measure wich will fill my gap of my paper.

I hope bad weather will not disturb your kind visit.

Yours faithfully,

K. Nakamura

(27) 1924 年 10 月 7 日 スコフィールドより中村へ

Dear Mr. Nakamura:

Many thanks for yours of the 3rd enclosing sketches.

I was, of course, wrong regarding Propontis, wich is 30 degrees further North. I enclose drawing of Sept. 29th, which coincides more nearly with yours. The triangular darker area of which Orcus and Cerberus form 2 legs and Trivium the apex, was not seen on the 30th (probably due to glare) but seen again on Oct. 1st. The canal connecting Cimmerium and Trivium is undoubtedly Laestrygon (not "a"). There seemed to me to be another canal connecting Ammonium and Trivium between Orcus and Antaeus, but this may have been an optical illusion, and I shall have to watch this region carefully. I did not see Cyclops as clearly as your drawing. There seemed to be a bit of hazy shading E. of S. endo of Cerberus, and this may have been Cyclops, but not at all sure. Trivium seems to me more extended than your drawing. Otherwise our sketches are practically identical.

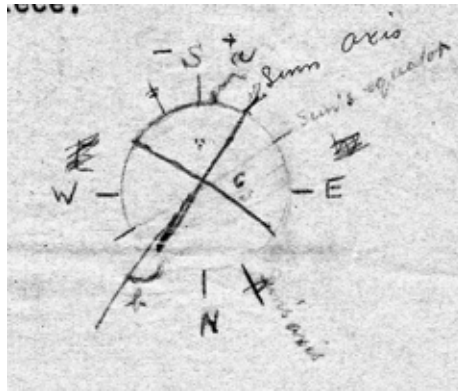
We have had unfavourable weather for the last 5 days, but this morning there were a few moments of sunshine, and I took advantage of the opportunity to have a look at the Sun. There is a new large group in the SE quadrant. The spectroscope showed a huge flame-like prominence about 120,000 miles high on E limb in lower latitude. Some gigantic force seemd to be deflecting the tip in a huge tongue of flame towards the equator.

Yours sincerely.

(28) 1924 年 10 月 9 日 スコフィールドより中村へ

Dear Mr. Nakamura

Thanks for yours of the 4th, and I note your interesting observations of the distribution of solar prominences. Regarding position and orientation of Sun's axis for October, will you kindly let me know if the following is correct, as seen in an inverting eyepiece:



(本文の地に直書き)

i.e. prominence “a” 55 degrees S. on E. limb.

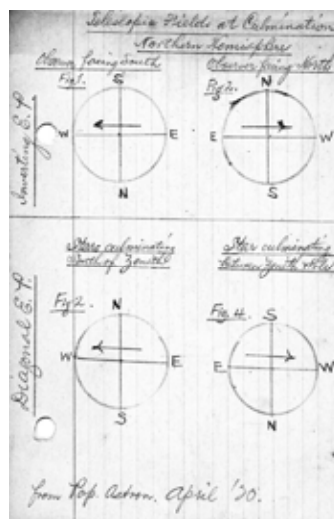
“b” 30 degrees N. “W.”

and sunspots “c” about 25 degrees N.E. quadrant.

There is a difference between the ephemerides in the standard text books and that published in the “English Mechanic” a few years ago, so please let me know if the above is correct.

I will call upon you next Sunday (12th) between 1 and 2 p.m., and Mr. Kennedy is also coming along. I do not know Kyoto very well, but presume the quickest route is by tram. I will bring the 6 1/2” Irving mirror with me, as you request.

Yours sincerely,



(同封図)

(29) 1924 年 10 月 15 日 中村よりスコフィールドへ

Dear sir,

I wish to call on you on the 19th (Sunday) at 4h p.m. for several business. First of all having finished careful study of your mirror I must return it to you. The testing

proved thoroughly good figure but the fact is too exaggrete (ママ) to write unless to speak. And also I wish to see the actual star image to confirm my testings since the mirror was silvered by me for shadow photograph. “Splender of Heaven” is not yet to hand but I will be able to bring on the time.

Yours sincerely,

K. Nakamura

(鏡面テストのデータ 別紙同封)

Zonal measure of 6.5” mirror by Irving made on Oct. 12, 1924

Focal length 1495mm F9.0

Axis	“a”	aberration	“b”	aberration
	r=73mm	-0.20mm	r=75	+0.02)
	64	+0.01	64	+0.10
	54	-0.01	54	-0.03
	45	+0.01	45	+0.02
	35	-0.08	35	-0.10
	12	-0.24±	—	—

K. Nakamura)

(30) 1924 年 11 月 23 日 中村よりスコフィールドへ

Dear sir,

I wish to visit you on the 25th at 6 p.m.. This is my last visit before my military service and must return instruments and book which you have kindly lent for me long while.

Yours sincerely,

K. Nakamura

(31) 1924 年 12 月 1 日 中村よりスコフィールドへ (手書き)

Dear sir,

Please rend me your letters hereafter to the following address.

伏見野砲兵第二十二聯隊第一中隊

一年志願兵 中村要

Yours faithfully,

K. Nakamura

(32) 1924 年 12 月 4 日 スコフィールドより中村へ

Dear Mr. Nakamura:

Many thanks for your postcard of the 1st inst. Giving your present address. I hope you have now got your 2" telescope down there, as you said you intended. You will be able to interest many people in the beauties of the heavens. I hope you will write me from time to time.

I was fortunate enough to witness a gigantic solar explosion recently. It was really a wonderful sight. Brilliant red flames and rocket-like jets rose to a height of 200,000 miles in a few minutes, in fact they were clearly seen moving rapidly. The whole outburst was over in 37 minutes. It occurred in the faculose region surrounding the leading spots of the recent great group which was just passing around the W. limb. I find solar spectroscopy very fascinating indeed.

With kind regards, I am,

Yours sincerely,

(33) 1925 年 1 月 29 日 中村よりスコフィールドへ (手書き)

Dear sir,

I have gone to your home on the 25th if you may at home when I have gone to kobe for some business but you were absent.

Hving already finished adjustment for setting and driving clock, 13" Calver is ready for observation. The performance of the mirror is quite wonderful compared with small aperture for faint objects but atmospheric disturbance is quite strong that I can not see nothing more than my 6 1/2" Ellison. Several eyepieces were purchased recently but accurate magnification is unknown and I wish to measure it. Will you not lend me your micrometer for magnification measurement if it were not in use? Price of 3 Volumes of the Splendour of the Heaven is 75 sen x 3 = 2.25 Yen.

Have you old number of English Mechanics before 1920? I wish to read contributions about Newtonian telescopes from them. As you know quite little can be found among astronomical magazine about the practical knowledge of mirrors except E.M.. Recently I have succeeded in making a parabolic mirror of 5 inches aperture and I wish to try 6 or 8 inch with some experience.

The eyepiece of 13" is quite high over the floor, sometimes it is about 12 foot above floor near the meridian. The reflector is an one of about 30years ago but it is very strong and delicate.

Yours truly,

K. Nakamura

(34) 1925 年 12 月 23 日 中村よりスコフィールドへ

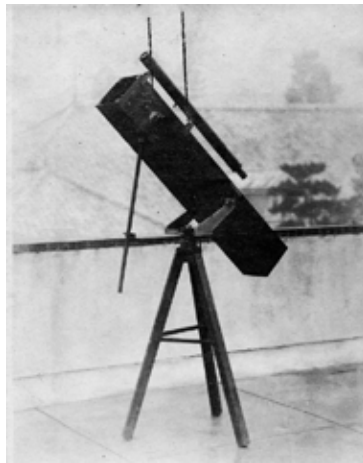
Dear sir,

One year of military service had passed safely and I am now working at the observatory. As you know the observatory was equipped with a secondhand 13" reflector by G. Calver and it is quite ready for observation. Another 13" Calver is come for the observatory of Tenmondokokai. Recently I have completed a light wooden mounting for may 6.5" Ellison. I have enclosed a photograph which will be interest to you. The mounting was almost excuted (ママ) with my hand at the observatory workshop.

I have last three volume 22, 34, 24, of "The splendor of the heaven" for you. If you require it I will send you at once. I have heard from Mr. Kawachi of Kobe that you have ordered a 12" reflector. I will be very glad if you will kindly give informations about.

Yours faithfully,

K. Nakamura



(同封写真：6.5"エリソン鏡用架台)

(35) 1925 年 12 月 30 日 スコフィールドより中村へ

Dear Mr. Nakamura:

Many thanks for your letter of the 23rd, enclosing very interesting photograph of your reflector. I am glad to hear that you have now returned from military service.

I shall be glad if you will send the vols. 22, 23 and 24 of the "Heavens", and let me know the cost.

I have been so occupied with other matters during the last few months that I have been unable to do anything beyond occasional observations of the solar prominences, of

which I have seen some beautiful ones. I intended to invest in a larger reflector, but business has been so poor that I cannot afford to do so just now. I am looking forward to the interesting opposition of Mars next autumn.

I am glad to hear that the Tenmondokokai also have a 13" Reflector. In your able hands these two large reflectors should be fruitful of very good results.

With best wishes for a very Happy and Prosperous New Year to yourself and the Tenmondokokai,

Yours sincerely,

(36) 1926 年 2 月 8 日 スコフィールドより中村へ

My dear Nakamura-San:

I am sending you, under separate registered cover, my Yeates dynamometer, which give very accurate readings for medium and high powers, but for very low powers of say 5 per inch of aperture, the disc becomes too large. Kindly return when you are through with the instrument.

Am enclosing P.O. for Yen 2.25.

Very interested to hear that you have succeeded in grinding a 5-inch mirror, and am hunting up old numbers of E.M. Will send later.

Yours sincerely,

(37) 1926 年 4 月 16 日 中村よりスコフィールドへ

Dear sir,

I must go to Kobe for the meeting of SAF on the 20th and wish to visit you at about 5 p.m. before the meeting, and I must return Yeates Micrometer.

I have constructed several 6" mirror for Newtonian telescope quite recently and 6" is now quite easy job for me. I am now working a 4.5" for Mr. Morishita. I have tested one of it against my Ellison with favourable result. The definition of image is quite satisfactory and stand power of 300 well- undoubtedly superior to Irving's. As far as my own Foucault test shows the surface reaches nearly standard of Calver or Ellison. But figuring is so difficult that I must leave some faults visible with shadow test. Now good glass plates are obtainable up to 10" aperture with fair thickness. I can proceed to that aperture. I can also make plane mirrors but plane is much difficult compared with parabolic mirror.

Yours truly,

K. Nakamura

(38) 1926 年 5 月 11 日 スコフィールドより中村へ (registered)

My dear Nakamura:

As per our recent conversation, I enclose herewith report of observations of solar prominences during April. It is almost impossible to secure daily observations, as very often when it is not cloudy or raining, the sky is not sufficiently clear of clouds and haze until it is time for me to go to the office. During this month I have so far only secured one observation. If you wish I can, in future reports, indicate approximately the positions of large prominences.

With regard to the flat of my 8 1/2", I now remember that I put it on the 6 1/2" Irving which I sold to Morishita, who will undoubtedly be glad to let you have it for testing purposes. I am glad indeed to learn of your success in making specula, which will undoubtedly be a boon to amateurs in Japan.

With kind regards, I am,

Yours sincerely,

(39) 1926 年 5 月 18 日 中村よりスコフィールドへ

Dear sir,

Many thanks for your kind report of prominence observation. As to the plane of 6.5" Irving. It was marked as 6 1/2"s H.N. Irving and it is undoubtedly an Irving. I have tested it but it was not perfect plane. If you have compared this with good prism, prism must be better. Quite recently I have tested plane of 13" Calver, it was best of optican's skill I have ever seen. About a week ago I have received a 6.5" mirror by Slade of Bristol. It was very carefully tested by most exact Foucault test, and it was found to be practically perfect. Mr. Slade is a most successful pupil of Ellison and Ellison proud of him. But I can say his mirror is not so perfect as Ellison. In the Morning Mars became rather prominent object and Polar cap is a beautiful object. Last time you have told me to resilver your Calver. I will attempt it if you wish it. I will go to receive mirror and I can return it within few days.

Yours faithfully,

K. Nakamura

(40) 1926 年 5 月 20 日 スコフィールドより中村へ

My dear Nakamura:

Many thanks for yours of the 18th. I am sorry I did not have an opportunity of seeing Dr. Yamamoto on his return from Himeji. I am writing him by this mail, enclosing some sketches of prominences.

I note you found Morishita's 6 1/2" flat to be Irving's. Upon hunting through my optical odds and ends I came across the flat which I am sending you under separate registered cover. Judging by its size, it may be the 8 1/2" Calver flat, although it is not marked.

I am very glad to not you found Slade's mirror so good.

I thank you for your kind offer to resilver my mirror. If you will let me know when it is convenient, I will send my assistant up with it.

With regards,

Yours sincerely,

(41) 1926 年 5 月 27 日 中村よりスコフィールドへ (手書き)

Dear sir,

Thank you for sending Calver plane. I have tested it with fine proof plane glass, and found to be fine piece of work, undoubtedly Calver's. But I can see very slight irregular point on it, but it will do no harm. If you have found prism better, question arise about the silver condition of that. This fine plane can not break image so seriously. Old and poor silver often damages image. Recently I have tested several prisms of fine optical quality against several planes, but none of them can compare plane. If we wish to get better result with prism, prism must be very excellent quality.

As to 8.5 inch mirror please bring me any time you convenient. I can do it and test for its optical quality within two or three days. If you wish I can do it from morning to afternoon.

I have noted our drawing of Mars in May number of Popular Astronomy.

Yours sincerely,

K. Nakamura

(42) 1926 年 5 月 31 日 スコフィールドより中村へ

My dear Mr. Nakamura:

Many thanks for your letter of the 27th, and your kind offer to resilver my mirror,

which I am now sending to you by my office assistant herewith. I am also sending the Calver prism, as you might like to test it. I should like very much to visit your Observatory again and see your new 13 1/2" Calver, and write to enquire whether it would be convenient for me to go there on Sunday next (6th June), arriving there a little before noon. I should like to bring with me Mr. C. Dresser, an old friend of Mr. Kenedy's, and also known to Dr. Yamamoto. At the same time I could take back the mirror to Kobe, if convenient to you.

I note with interest your test of the flat I set you, which is undoubtedly Calver's, and it will be interesting to compare with the Calver prism I am now sending you. Would you mind also resilvering the flat, so that I can try it out again with the prism, as the difference in definition may, as you say, have been due to the silver on the flat.

Dr. Yamamoto writes me that Prof. Pickering has published our drawings of 1924. Mars apparition in the May number of Popular Astronomy, but as I have discontinued my subscription this year and have not had time to receive the extract of report from Jamaica, should be obliged if you could spare your copy for a few days.

Thanking you for your trouble in resilvering my mirror, and with kind regards, I remain,

Yours sincerely,

(43) 1926 年 5 月 31 日 中村からスコフィールドへ (手書き)

Dear sir,

Thank you for your kind message. I am very happy to test Calver's work. No one absent Ellison can beat Calver's. I will test prisms also. Dr. Yamamoto is now out of room, probably at his house, so I can not show your letter. I will be very glad if you will come here. Dr. Yamamoto will be also glad. As to Popular Astronomy (May number). Dr. Yamamoto received it. But that does not reach to observatory library, so I am very sorry to that I can not let you it. Till next sundy it will come to our library.

Yours faithfully,

K. Nakamura

(44) 1926 年 6 月 2 日 中村からスコフィールドへ (手書き)

Dear Mr. Schofield,

Soon after mirror and prism were received, I have tested them. The mirror was found to be fine example of Calver's excellent work as I have expected. It is excellent

except there is a central hill which comes after diagonal shadow. We can not expect better specula of F10 focus even today. As to the prism it is good but optically certainly inferior to plane. One of square is not perfect and glass itself contains some straise. With the autocolimation test it appears inferior to plane. It gives no distortion of image but it undercorrected the image. I can not say which will give better definition, but you will find with prism the inside of focus image has central hallow and out side focus image has nucleus much compared with plane.

Silvering of both mirror has already finished and brilliant silver was obtained.

I am very glad to see Mr. Dresser will come with you. I will wait for you before noon on next Sunday with prof. Yamamoto.

Yours faithfully,

K. Nakamura

(45) 1926 年 6 月 7 日 スコフィールドより中村へ

Dear Mr. Nakamura:

With regard to the 4 1/2" mirror of 30" focal length, will you kindly have the outside of the tube painted white. When I mount this on the 8 1/2", I shall be able to work much more comfortably.

Do you know if I can get a ring micrometer in Japan, and where?

Thanking you for your trouble, and for the very interesting time yesterday.

I remain,

Yours sincerely,

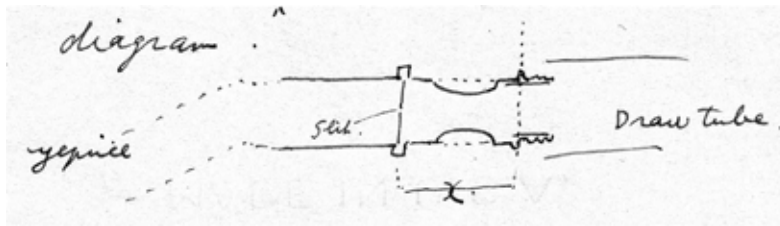
(46) 1926 年 6 月 12 日 中村よりスコフィールドへ (手書き)

Dear sir,

Thank you for your kind letter. The mirror is already completed. Its clear aperture came out as 4 1/4" or 108mm and focal length 29 inch which will fit your purpose.

When polish was finished its figure was very bad. It was deep hyperbola with most dreaded tuned down edge, which figure is most difficult even to skillful optician. It was quite difficult to figure as I have considered impossible once, but fortunately it was successfully parabolized after most difficult figuring troubles. To my experiental eye some defect certainly exist, but it is impossible to remove because such defect are always found on almost every mirror. Especially short focus reflector is difficult to figure. I will soon put this to mechanician's hand for the construction of tube, etc. I have

understand to paint outside of tube to white to reflect heat ray. Please let me know the distance between slit and screw point as my diagram.



(本文の地に直書き)

I have figured the mirror specially for solar observation. After completion, I wish to bring that with me to you.

Yours truly,

K. Nakamura

(47) 1926 年 6 月 15 日 スコフィールドより中村へ

Dear Mr. Nakamura:

Many thanks for yours of the 12th, and the trouble you have been to in connection with the 4 1/4" mirror. This is very quick work indeed. I know that it is very difficult to figure mirrors of such short relative focus.

Will you please also silver the mirror as well as the flat, as I do not think the reflectivity will be sufficient, and I now remember that the 6 1/2" Irving unsilvered gave much less light than even the 2" refractor, and some of the prominences are very faint. I can always desilver the 4 1/4" mirror in case I find the light too strong or should there be any trouble due to air currents, but if you make the tube wide enough, say 6" in diameter, I do not anticipate any trouble from this source, for I recollect than I never had any trouble with the 4 1/2" Ellison in this regard.

Replying to your query, the distance from slit to eye end of draw tube is one inch, but please have the rack and pinion mounting made not more than 2 inches long, less if possible. That of my 8 1/2" Calver is only 2 1/4". The great fault with many makers is that they make this part entirely too long.

I should like to have two clamping screws placed 5 inches apart near the balance point of the tube, 3/4" long x 5/16" dia., also the tube and cell to be as light as possible, as I intend to carry your telescope with me when I to on any business trips, so as to continue my observations as far as possible, for which purpose I intend to use the mount of my 2", which was originally for a 4" Gregorian, and should be quite substantial enough to carry the 4 1/4" Reflector. I also have a tripod for this mmount.

I enclose sketch in case any of the above may not be clear, but in case you have

already put your mechanic on to the job, please disregard such points as are found impracticable.

With kind regards, and thanking you again for your trouble, I am,

Yours sincerely,

(48) 1926 年 7 月 1 日 中村からスコフィールドへ (手書き)

Dear sir,

I have went to mechanician's yesterday. The work on the 4 1/4" reflector was well advanced. All metallic parts except eyepiece rackmotion were ready for assembling.

I have took liberty of making diameter of tube 5.5 inch instead of 6". It will probably safe for heat current if the inside of the tube is covered with some non-metallic substance. The mirror cell was made somewhat large and heavy but whole weight is that one can lift with single hand easily. The mounting will complete within about 10 days. I will test it after completion and expect to take it to you about the middle of this month.

Yours faithfully,

K. Nakamura

(49) 1926 年 7 月 7 日 スコフィールドより中村へ

Dear Mr. Nakamura:

Many thanks for your letter of 1st. inst. I am glad to note that you expect the 4 1/4" solar reflector to be finished by the middle of the month.

I will not ask you to trouble to bring it down specially, but if you have some other business in Kobe, I should be glad to have you spend the day with me on Sunday the 25th. If you are coming down, please let me know what train.

I have been able to make only 3 sketches of Mars so far. Seeing has very bad, and cannot see much detail.

Yours sincerely,

"Enclosed in cover to Dr. Yamamoto" (鉛筆書追記)

(50) 1926 年 7 月 13 日 スコフィールドより中村へ

My dear Nakamura:

I wrote to Dr. Yamamoto on the 5th enclosing my solar prominence report for Jun,

also a cover to you, but as I have received no acknowledgement, I am afraid that my letter may have gone astray in the mail.

I have just received from Prof. Pickering a copy of his report on Mars No.35, and must congratulate you on your wonderful work with the 7" Zeiss. It is a pity we cannot get more observers in Japan. I have noticed that we always appear to see things very much alike, and as Pickering sees them, and I cannot account for Dr. Ellison seeing the markings so dark and sharp, seeing that his telescope was not so much larger. It also seems that the giant telescopes are of little use for visual work of this description.

If you did not receive my letter of July 5th, I wrote you that I should be glad to see you on the 25th, if convenient.

Yours sincerely,

(51) 1926 年 7 月 14 日 中村よりスコフィールドへ (手書き)

Dear sir,

Many thanks for your kind letter of 13th. I have received your letter of July 5 but I was delayed to write. Dr. Yamamoto is now in Manchuria for Astronomical lecture and he is expected to return Kyoto about July 20. I have also received report from Prof. Pickering. The report is very interesting and I wish to talk about the Mars on the day visit. Thank you for your kind offer to go on 25th. The mechanical works on the reflector is expected to complete within two days except for painting which will require several days to dry and several days for final star testing. Therefore it will be good time to go for Kobe with it on 25th. I wish to go for Kobe in the afternoon but I have some business, I wish to show you the time in the next letter.

Yours sincerely,

K. Nakamura

(52) 1926 年 7 月 22 日 スコフィールドより中村へ

Dear Mr. Nakamura:

I duly received your letter of the 14th, and have been awaiting your further letter, as I understood you were not sure of coming on Sunday next. In fact, there is no immediate need for the 4" Reflector, as I can manage quite well with the 2" except for high altitude observations, so please do not hurry. If I do not hear from you again by Saturday morning I shall understand you will not be coming.

With kind regards,

Yours seicerely,

(53) 1926 年 7 月 22 日 中村よりスコフィールドへ (手書き)

Dear sir

On Sunday, 25th, I expect to arrive at Sannomiya Station at 1:50 p.m. with the 4 1/4" Solar reflector.

The body had completed today and I wish to test it tomorrow. The mechanical work costed ¥55 as enclosed application. This seems to be a little costly but charge for wooden moulds for casting and castings are unavoidably costly for such new and single matter. My own price for 4 1/4" mirror and 1 1/8"(28 mm) flat is ¥25. Therefore the reflector cost ¥80, but I consider this is comparatively cheaper compared with imported. As to the detail of mounting I wish to talk will you on the day visit.

Yours faithfully

K. Nakamura



(同封請求書)

(54) 1926 年 7 月 27 日 スコフィールドより中村へ

My dear Nakamura:

I tried your 4 1/4" Reflector last night, for the first time, on Saturn (which is a fairly good test object), using my Steinheil monocentric (x100), and was surprised at the sharpness of the image. I also tried it this morning on the Sun with power x38 and even when the aperture was reduced to 3/4" (eccentrically) it showed the fine filaments of the penumbra clear and sharp. Considering the difficulty you had in making a mirror of

such short relative focus, I must really congratulate you on the excellence of your work. The mirror is as good if not better than the 4 1/2" Ellison. I also tried to make some prominence observations but failed owing to clouds. I am very well satisfied with it optically, but as regards the mechanical part I must make one or two criticisms. The draw tube is entirely too narrow, and an Ordinary size Huyghenian ocular cannot be used. In my case it does not matter, as I have a triple no sepiece. I suggest that you adopt the relative size of my 8 1/2" Calver, which would make a good standard for your 6" reflectors, also Calver's system of flat mount which is much easier to adjust. How that your reflectors are getting to be known and appreciated, it is a good time to establish a standard for your mechanical parts.

The sun is again very active, and the new group in SE quadrant is very remarkable in its leader having a bright nucleus.

With kind regards,

Yours sincerely

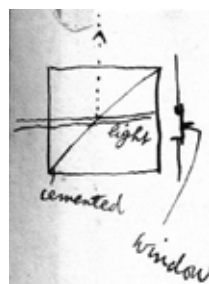
(55) 1926 年 7 月 29 日 中村よりスコフィールドへ (手書き)

Dear sir,

The past Sunday was very interesting with astronomical conversations.

The flat mirror which was found in the eyepiece box was found to be very fine one. It is undoubtedly a Calver and I am very happy, to have obtained to use such fine place by famous maker. On the otherhand Irving flat for star diagonal was found to be very poor. It was found to be not a worked plane but only cut from a commercial plate glass. Its surface is therefore irregular.

The sundiagonal I sone fo peculiar construction. This type was not find on any books through I know one by Steinheil. The two right angled prism are cemented with balsam. The refractive index of glass material and balsam are different to very small degree. Therefore a very small amount of solar ray is reflected from the cemented surface, which is very much smaller in amount compared with Herschel Solar prism. The prism was found to be good one.



(本文地に直書き)

The receipt for the mechanical part of reflector was enclosed.

Yours truly,

K. Nakamura

(56) 1926 年 7 月 29 日 中村よりスコフィールドへ (手書き)

Dear sir,

I am very happy having obtained a good report on my mirror. It is my eleventh mirror and Ellisons $4\frac{1}{2}$ " was over hundred. The experiences on mirror making is quite different. I know well my mirror is slightly inferior to Ellison from want of experience, but I believe I can improve step by step.

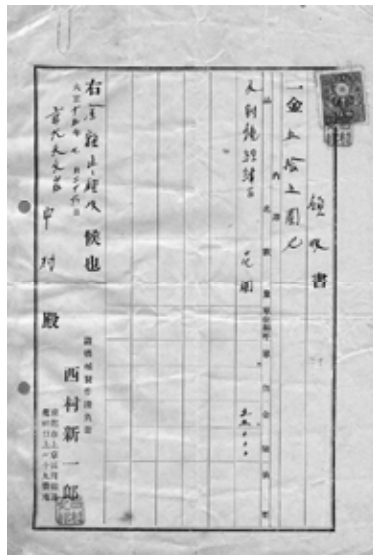
As a practice F6 is photographic focus and can not give sharp visual image such as $4\frac{1}{2}$ ", which focus was 475" or F/10.5.

The draw tube is certainly too narrow for English big eyepiece. It was constructed according to German diameter 24.5mm. I wish to revise in the next reflector.

Also diagonal adjust is poor, and I wish to employ next time Brashear's construction, which I consider better than Calver's.

Yours faithfully,

K. Nakamura



(同封領収書)

(57) 1926 年 7 月 31 日 スコフィールドより中村へ

My dear Nakamura:

Your 2 letters of the 29th duly to hand, and I am glad that the Calver flat will be of

use to you. You can also keep the Browning solar prism if you like, as I believe you have no solar e.p. at present. By the way, if you have a high power Kellner e.p. that you can spare, you might send it along with the cover for the 4 1/4" tube. Do not trouble to return Irving flat.

I made an observation of Mars on the morning of the 28th, but seeing was poor even when 8 1/2" was cut down to 6 1/2", so I decided to try your 4 1/2" with x105 e.p. and Barlow lens = x165, and I found that although polar cap was not so bright, your 4 1/2" showed more detail than 6 1/2" of 8 1/2", and image was very much steadier. (By the way, there is nothing wrong with Barlow lens and colored images of pine needles we saw, must have been due to improper adjustment. There was not the slightest trace of colour in your 4 1/4").

Your 4 1/4" will be valuable adjunct in Kobe where seeing is not so good, and the above bears out what Pickering says, that if the quality of seeing is suitable only for a 4" or 5" aperture, then the largest telescope in the world will not show more, in fact the larger the aperture the less you will see clearly.

Unfortunately owing to cloudy weather I have been unable to make use of your 4 1/4" for prominence work. I also find it much more difficult to control the slit owing to slight backlash in azimuth slow motion of 8 1/2", and I may mount your 4 1/4" on the Gregorian stand. I was able to make an observation of prominences this p.m., using 2", for the first time since 22nd, but there was nothing remarkable, notwithstanding present numerous sunspots.

Yours sincerely,

(58) 1926年9月6日 スコフィールドより中村へ

My dear Nakamura:

I am in receipt of a letter from Prof. Pickering correcting the following misprints in his Report No.35, viz:

On page 13, line 23, my name should appear instead of Mr. Ellison.

On page 14, line 16, read "Helorus" instead of "number 13."

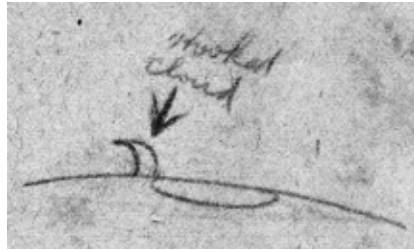
He also says that if you have got any drawings in September showing canals Calydon or No.15, not already set, he would be glad to have them.

Yours sincerely,

(59) 1926年9月10日 スコフィールドより中村へ (手書き)

My dear Nakamura:

While observing Mars this morning I noticed at 0.30h the following curious bright hooked cloud E edge of S polar cap.



(本文の地に直書き)

Did you also see it?

I suppose you are now making continuous observations of Mars. When seeing is good your 13 1/2" will have great advantage. I have followed Pickering advise regarding using Barlow lens. I find use about 40/50% higher magnification under same seeing conditions.

Yours sincerely, Schofield

(60) 1926 年 10 月 2 日 中村よりスコフィールドへ (手書き)

Dear sir,

Many thanks for your kind letters. I was quite busy with several trips.

I have commenced regular observation of Mars, but I have not obtained fine view of Martian surface owing to bad seeing. The optical quality of 13" mirror is quite excellent, but its aperture is too large for ordinary atmosphere condition and stop improve very little to definition. My 6.5" is not available for the construction of complete mounting at present.

The observatory have ordered a 12 inch Cooke refractor which is expected to arrive early in 1927. Two prominence spectroscopes by A. Hilger had reached to Dr. Yamamoto. Its single cost was £6 7s which is considerably cheaper compared with your's, but its dispersing power is quite low probably from cheaper grade of grating. I can use it with great interest.

Yours faithfully

K. Nakamura

(61) 1926 年 10 月 5 日 スコフィールドより中村へ

My dear Nakamura:

Many thanks for yours of October 2nd. Seeing here has also been very bad lately and I have only rarely been able to use full 8 1/2", --- 6 1/2" as a rule and often only 5" could be used. Also for prominences I have had to revert to my 2".

Last evening (10.30 p.m.), I noticed a very interesting obscuration of Sinus Sabaeus as marked in circle on sketch enclosed. Did you happen to make observation at the same time? The obscuration lasted during the whole observation of one hour, and was not seen on previous evening.

Very interested to learn that you have received the two solar spectroscopes. I should like to try out one of them down here.

Yours sincerely,

(62) 1926 年 10 月 7 日 中村よりスコフィールドへ (手書き)

Dear sir,

Thank you for your kind letter of 5th, which enclosed your interesting observation of Mars. I have observed on the 4th but unfortunately no observation was made on the 5th. Martian surface is very interesting. Libya region seems to be completely darkened already. I have seen cross (\oplus) of Hellas with the 13".

I must go to Kobe on the 9th for the meeting of S.A.F. and with to visit you at 4:00 p.m.. I wish to take with me Hilger spectroscope and to speak about Mars.

Yours sincerely,

K. Nakamura

(63) 1926 年 10 月 15 日 スコフィールドより中村へ

My dear Nakamura:

I am just in receipt of a postcard from Prof. Pickering saying that he would be glad to have any drawings of Thaumasia and Solis Lacus secured during the latter parts of August and September sent as soon as possible. Unfortunately I was only able to make one sketch (that showing the hooked cloud), which I am sending, together with sketch showing development of Sinus Pons. If you have any drawings of the above region I suggest that you send them to Prof. Pickering.

He also "believes that a wooden casing completely" covering the metal tube of a reflector will greatly improve "the definition". Although he does not say whether this applies only to reflectors in the open, or under a dome.

Seeing here has been terrible lately, about 4-5 with 6 1/2" only during rare

moments, and as a rule can see nothing at all. It was very good here during Oct. 1924.

I tried your solar spectroscope for a few minutes on Sunday and find size of image is exactly same as mine. One side of slit seems to affect definition, so chromosphere must be focused on other side. Would you mind if I filed a little notch in the rim, so as to use may paper circle?

Yours sincerely,

(65) 1926 年 11 月 3 日 中村よりスコフィールドへ (手書き)

Dear sir,

The seeing condition of Kyoto had been very good recently. Last night was very calm and seeing condition attained 13 on standard scale. The martian marking had been admirably defined. The Lacui Solis was most interesting, it was resolved into several lakes. The shading of region of Nector canal is noteworthy nature of the present.

I have completed my new mounting complete with slow motions for my 6 1/2" Ellison mirror and Calver flat, and I wish to comment prominence observations with 2" refractor attached to it*. I have a plan to construct a 3" reflector of about 24" focus specially for prominence observation.

Yours sincerely,

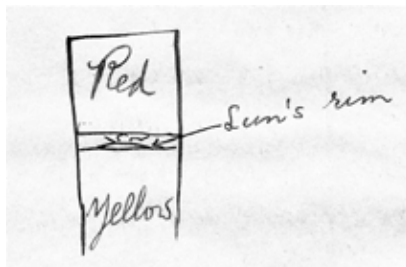
K. Nakamura

* I need Hilger spectroscope now at your home. Will you kindly return it.

(66) 1926 年 11 月 6 日 スコフィールドより中村へ

My dear Nakamura:

As requested in yours of the 3rd, I have returned your solar spectroscope by registered post. I think you will get better definition by focusing on slit as follows:-



(本文の地に直書き)

If you intend to attach a circle, please have an extra one made for me. (Which I will, of course, pay for), so that all observations in Japan will be on same standard. Owing to bad seeing, lately I have been using my 2" exclusively, and on the whole I think the

refractor better for this class of work, for, when the seeing is bad, as you know, the aberration owing to reflection will be double in the reflector.

I am glad to hear that seeing has improved in Kyoto, and hope it will continue. I have had very bad seeing here lately, as I told you, but have an idea that neighbour's chimneys may be partly responsible. I have never had a good square look at Solis, but I observe Nectar is very wide this year.

With kind regards,

Yours sincerely,

(67) 1926 年 11 月 10 日 スコフィールドより中村へ

My dear Nakamura:

Just a line to let you know that seeing was very much improved here last night. Owing to a bad cold I did not observe for several days, but last night being warm I decided to have a peep at Mars at 8 p.m., and was struck with the great improvement in seeing. I obtained best results with 7 1/2" x 235 and 310, average seeing 7 – 8, sometimes 10. Development of Nepenthes-Thoth region was clearly defined. Full 8 1/2" did not give so good definition. I sincerely hope the good seeing will continue so that we can make the same success for Japan as in 1924.

I had a call from Morishita last night. He says he has completed the mounting for his 6 1/2" Irving. With a little more experience he will be a very useful observer, and he is very enthusiastic. He glimpsed 2 arms of the Cross of Hellas with my telescope, but unfortunately I could not confirm the observation.

Have you seen Canal No.15 of Thaumasia? I have seen it only ones this apparition.

Yours sincerely,

(68) 1927 年 2 月 19 日 スコフィールドより中村へ

My dear Nakamura:

I have not had the pleasure of hearing from you for a long time. I hope you have been successful in your Martian observations. I am just in receipt of a letter from Pickering, in which he says he is very anxious to hear from you.

I hope to recommence Solar prominence observations from next month.

With kind regards, and hoping to hear from you.

I remain,

Yours sincerely,

(69) 1927 年 2 月 22 日 中村よりスコフィールドへ (手書き)

Dear sir,

Thank you for your kind letter to Feb 19. I have went to Kobe on 20th for S.A.F. meeting.

Having found great difficulty for prominence observation with ordinary telescope. A 3 inch reflecting telescope of 25 in focal length is now under construction. I expect it will be useful for specially prominence observation from April.

Prof. Pickering wrote me several times and about a week before I have sent six complete drawing of 1926 equal to 1924 21 was great delay and troubled him.

A portrait (Reproduction) of Mr. G. Calver is enclosed. I wrote to him to know the constructed year of 13" Calver and for a portrait. He wrote he is now 94 years of age and very weak but he can still work. Also he cannot find the year, because probably he made too much 12.5" to remember, and kindly sent me a portrait. The mirror which he is handling is the very one that Prof. Pickering is now using (12 1/2"). You have his reflector and it will be interesting to you.

Yours truly,

K. Nakamura



(同封写真：カルバーから贈られた肖像写真のコピー)

(70) 1927 年 3 月 4 日 スコフィールドより中村へ

My dear Nakamura:

Many thanks for your kind letter of the 22nd Feb., enclosing interesting

photograph of Mr. Calver. Please let me know if I may keep this photograph.

I am very glad indeed to hear that you have sent Prof. Pickering 6 drawings as good as 1924, and trust you will have a repetition of your success of that year. Ellison at Colombo also seems to have made some interesting observations, judging from recent numbers of the English Mechanic.

I have not yet been able to restart my solar prominence observations, as I have been awfully busy, but hope to do so from April: I note you intend to make a special 3" reflector for this work, but from my own experience here, unless the seeing is tolerably good. I have obtained the best results with the 2" refractor, which just seems to suit the particular type of small spectroscope we are using.

With kind regards, I remain,

Yours sincerely,

(71) 1927 年 3 月 9 日 中村よりスコフィールドへ (手書き)

Dear sir,

Thank you for your kind letter of march 4. The portrait of Mr. Calver is a reprint from my original, there you may get it. I have ordered a 6 1/2" mirror of 6 feet focus which mr. Calver kindly offered it. I have no special intention to use it except for a text. The mirror is one of his recent make, and I ordered it because he says he can not make mirror from his bad health, and he is 94 years of age. I have now passed 45 mirrors and I am always busy for mirror making.

Recently I have obtained a battery of 7 old Browning Achromatic eyepieces form Baker. They were found to be excellent ones and better than expensive orthoscopic eyepiece of modern constructor.

My 3" reflector was made specially short focus of 25" to suit the Hilger spectroscope.

Yours faithfully

K. Nakamura

(72) 1927 年 5 月 5 日 中村よりスコフィールドへ (手書き)

Dear sir,

I have completed a 3 in Newtonian for prominence observation recently, and some experimental observations were already made. The small reflector seems to be successful, easy to use, and about 15 minutes is sufficient to go around the solar limb.

The focal length is 25", but it seems to be slightly too long. The small reflector is mounted parallel with 6.5" Ellison and is quite easy to use. I must go to Kobe on 7, 8, 9th for the general meeting of S.A.F. and I expect to get happy hours to speak with you.

Yours faithfully

K. Nakamura

(73) 1927 年 6 月 20 日 スコフィールドより中村へ

My dear Nakamura:

Owing to the hard times, I am thinking of selling my 8 1/2" Calver. Do you know anyone who wants to buy such an instrument? Later on, when business improves, I shall probably buy one of your 6" Reflectors, which is about large enough for Kobe.

Yours sincerely,

P.S. The 8 1/2" has 3 e.p.

(74) 1927 年 6 月 27 日 中村よりスコフィールドへ (葉書、手書き)

Dear sir,

Thank you for your kind letter of June 20. I am now in Sapporo city of Hokkaido for observation of Winnecke's comet.

I am sorry to hear you must sell 8 1/2", which is quite excellent instrument. I will try to advertise the same in the "Heaven" to find purchaser. As to the particulars I wish to get another letter from you.

Yours faithfully

K. Nakamura

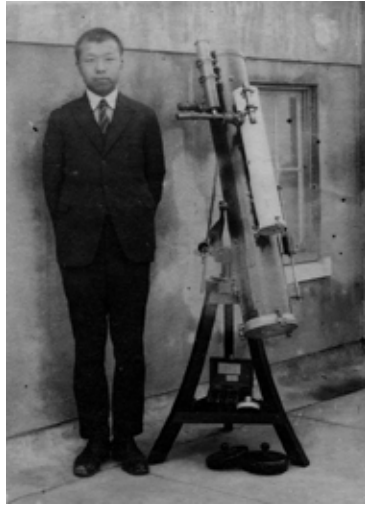
(75) 1927 年 9 月 27 日 中村よりスコフィールドへ (手書き)

Dear sir,

I have recently received a letter from Mr. Goto of Tokyo. He is the secretary of Tokyo department of S.A.F., and he desires to obtain your 8 1/2" Calver reflector. Please let me know the price of the instrument, which you are intending. I think it is better not 1/10 sell the same which done splendid works for several years and must do excellently in the future, except for severe troubles. Mr. Calver was reported to have died last July 7 at his 92 years of age.

Yours faithfully

K. Nakamura



(同封写真：中村要と完成した
6.5”エリソン経緯台)

(76) 1927 年 10 月 3 日 スコフィールドより中村へ

My dear Nakamura:

Many thanks for your kind letter of Sept. 27th. I am willing to sell my 8 1/2" Calver for ¥650 C.O.D. ex my house, as I cannot pack and ship the instrument to Tokyo. This includes three e.p., x 75, 150 and 235. Focal length is 7' 2". The above price is what it cost me when the Yen was at 2/S.

Yes, I noted with great regret the death of Calver. A great and wonderful career!

With kind regards,

Yours sincerely,

P.S. As I do not have to go so often these days to Osaka, I am trying to arrange so as to have an hour at noon time for prominence observations. I very much regret my inability to keep up the reports on this very interesting branch or observational work. I will let you know again later if I can manage to resume the work.

Please note, in case Mr. Goto decides to buy the above instrument, to let me have say 3 days notice, before taking delivery.

(77) 1933 年 2 月 15 日 スコフィールドより中村へ

Dear Mr. Nakamura:

Having finished my new code work, I intend taking up again astronomical studies.

I should like to have my 8 1/2" and 4" mirrors and flat silvered. Please let me know what your charges are, and whether you have someone in Kobe to whom I could deliver the mirrors and flat.

With kind regards,

Yours sincerely,

1927 年 4 月 27 日 上田穰よりスコフィールドへ

My Dear Mr. Schofield: -

I am glad to write you.

I have highly appreciated your observations of prominences reported monthly in the bulletin of our Society of Astronomical Friends. Since several months, I succeeded Prof. Issei Yamamoto for the edition of the bulletins and I found it very regretfull (ママ) that you have discontinued the observation for a while owing to your own business. Now I heartily invite you to resume the valuable observations soon as possible.

Yours truly,

J. Ueta.

1927 年 5 月 5 日 スコフィールドより上田穰へ

Dear Mr. Ueta: -

I duly received your letter of the 27th, but extremely regret that owing to business and travelling around. I have been unable to resume observations of solar prominences. These observations sometimes take as much as 1 1/2 to 2 hours to completely survey the limb, and I really cannot spare the time just now. In fact I am thinking of selling my 8 1/2" Calver.

I am hoping to be able to take up the subject again when it becomes less difficult to make a living, and have more spare time.

Yours truly.

1924 年 1 月 31 日 スコフィールドより京大天文台宛

Dear Sirs:

I have today remitted you through the P.O. ¥4.80 for 2 copies of your excellent magazine "The Heavens."

Please mail, as before, to:

R. SCHOFIELD,
P.O. Box 261,
KOBE, JAPAN.

I have a new driving clock made by C. Baker, London, complete with weights, suitable for a 3" Telescope. Cost price ¥500, but am willing to accept ¥300. Do you know of anyone needing same for his telescope?

Yours faithfully,

RS:SF.

1924 年 2 月 2 日 T. Ebi よりスコフィールドへ (葉書、手書き)

Dear Sir.

We have received your subscription ¥4.80 for 2 copies of "The Heavens". And we are going to inform your new driving clock made by C. Baker, London, to a member in Tottori Ken. Please wait a few days.

Yours faithfully,

T. Ebi.
Kyoto University Observatory

1924 年 2 月 5 日 T. Ebi よりスコフィールドへ (手書き)

Dear Sir.

I have the honour to inform you that I have found a member of our society who is willing to buy your driving clock made by C. Baker, London, as a cost of ¥300. Please send your clock to the next address. By what means will be send you the cost? Please let me known about it soon.

Yours faithfully,

T. Ebi
Tenmondokokai, Kyoto Observatory

鳥取市川端三丁目 大坪雄太郎様

Mr. Yutaro Otsubo,
3 cho me, Kawabata, Tottori City.

1924 年 2 月 7 日 スコフィールドより T. Ebi へ

Dear Sir:

Replying to your letter of the 5th inst., I regret that I have no means of packing the instrument properly, so that it would be more convenient if Mr. Otsubo could arrange to take delivery of the instrument from my house.

Thanking you for your trouble,

Yours faithfully,

RS/YO:

1924 年 2 月 10 日 T. Ebi よりスコフィールドへ（手書き）

Dear Sir.

Having received of your letter of the 7th inst., I have to inquire you about your driving clock whether it is weight-driven or spring-driven. Mr. Otsubo is wishing to buy a weight-driven one . Please give me your answer very soon.

Yours faithfully,

T. Ebi

1924 年 2 月 12 日 スコフィールドより T. Ebi へ

Dear Sir:

Replying to your letter of the 10th, my clock is weight-driven. Sometime ago I mounted a very light 6 1/2" Reflector in skeleton tube on the equatorial mount of a 3" Refractor, and the clock worked very well with 2 weights only.

Yours faithfully,

RS:SF.

1924 年 2 月 16 日 T. Ebi よりスコフィールドへ（手書き）

Dear Sir.

I have much pleasure in introducing to you my friend, Mr. Otsubo, who is an honorary member of our Society of Astronomical Friends of Japan.

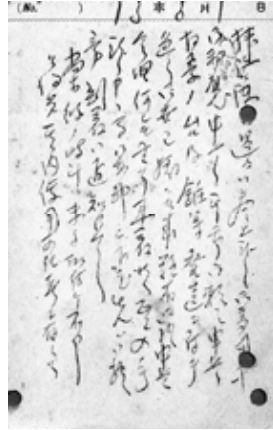
Mr. Otsubo will buy your driving clock at the cost of ¥300 as I have informed you the other day, please hand it to him at your house to-day.

Thanking you in advance, I am, Yours very truly,

T. Ebi.

（大坪雄太郎の名刺同封）

1924 年 3 月 1 日 大坪よりスコフィールドへ（葉書、日本語手書きのこの文面をスコフィールドが読めたのかどうか）



1922 年 5 月 20 日 島津製作所の島田よりスコフィールドへ

Dear Schofield-San,

Mr. Benji Murayama, my old tuitor who is very much interested in Astronomy, asked me to write to you asking to kindly arrange some day at night to receive him and show him your big telescope which, I was informed, you have recently erected in your house.

I shall be much pleased if you will kindly spare some hours for him when most convenient to you, and write him direct to

Mr. Benji Murayama,

Tarumi mura, Akashi-gun.

So that he may come up to you and enjoy himself with the marvelous celestial view through your telescope.

Trusting you are keeping well all these days, I beg to remain, Schofield-San.

Yours sincerely,

H. Shimada

1922 年 5 月 27 日 スコフィールドより島田へ

My dear Shimada-San:

I am duly in receipt of your of the 20th, and shall be very glad to meet Mr. Murayama. The trouble is I am travelling about so much lately that I am unable to appoint a definite time, but if Mr. Murayama happens to be in Kobe at the time or coming here, if he will be good enough to let me know I shall only be too glad to show

him my telescope, which, by the bye, is not such a wonderful instrument after all, and is a very big and clumsy outfit, although bearing the name of a celebrated maker. In fact, I much prefer the comfort I used to enjoy with my little 3" equatorial.

I must apologize for not having replied earlier, but as a fact, only got back from Tokyo a couple of days ago.

With kind regards, and hoping yourself and family are all well.

Yours sincerely,

1924 年 4 月 8 日 スコフィールドより T. Ebi へ

Dear Sir:

This will serve to introduce to you Mr. J.F. Janning, or St. Joseph's College, who desire to obtain the tube and accessories for a 4" Refractor Lens.

Any courtesies or advice which you can extend to Mr. Janning will be greatly appreciated by,

Yours faithfully,

RS/YO:

1924 年 4 月 8 日 スコフィールドより T. Ebi へ

Dear Sir:

I have given a letter of introduction to your goodself, to Mr. J.F. Janning or St. Joseph's College. They have just obtained a good 4" objective, with oculars and draw tube. I have suggested Mr. Jannings calling upon you in regard to the cell, tube, and stand.

I shall gratly appreciate anything you can do for this worthy institution, and remain

Yours faithfully,

RS/YO:

1924 年 3 月 24 日 スコフィールドより ジャニングス へ

Dear Mr. Janning:

I must apologize for this tardy acknowledgment of the very nice photograph you sent me, and am very glad indeed to have been of some service to your excellent institution.

With kind regards, I remain,

Yours sincerely,

RS/YO:

1924 年 4 月 23 日 ジャニングよりスコフィールドへ（手書き）

Dear Mr. Schofield:

When I was in your office, I told you that I would call on Mr. Ebi during this week but present circumstances hinder me from doing so.

I am sorry that your letter directed to Mr. Ebi should contain any such information; however during the month of May I expect to find a suitable time to make the visit.

I received a Japanese booklet a few days ago from Mr. Ebi. — In this booklet to me —

Yours sincerely,

J. F. Janning

1924 年 4 月 24 日 スコフィールドよりジャニングへ

Dear Mr. Janning:

I am in receipt of yours of yesterday, and do not think it will make any difference, as I feel sure Mr. Ebi will be glad to see you. The booklet you received is probably their monthly magazine “The Heavens”. Astronomy is making great strides in Japan.

Yours sincerely,

RS:SF.

1926 年 9 月 5 日 ジャニングよりスコフィールドへ（手書き）

Dear Mr. Schofield:

It is now three years that the opportunity presented itself to you — and lucky for us that you grasped it — to become the Founder of our new laboratory.

But what would you say if you knew that the good start you made remained apparently dormant! Rest assured this is not the case. Each year the College has done a little — all that is within its present means — and each year it hopes to do still more.

This year being the Silver Jubilee of the College we hope to give the laboratory, that you started, a strong impetus, so you may see from the enclosed estimate.

Will you, Mr Schofield continue to interest yourself in the good work you so generously shorted by taking an active hand in pushing your laboratory to a skill higher niche?

Cooperation is the word that spells success it is the keyword that unlocks the door to advancements, otherwise unattainable.

With you as leader, among the men of scientifically interested minds, or willing to give to the boy & young man in the orient all that can be his, it will be a praiseworthy matter for you to raise the required sum. I believe it will even be possible to you over & above than sum for there still remain many apparatus to be added to the laboratory before it is complete.

History books with truer appreciation upon acknowledge accomplished than the present passing moment. Some day when the records of these reconstruction days of the College are written for the public — one name & that is your honor Mr. Schofield — will stand forth a prominent one among all these who gave us the glad hand & hearty cooperation.

With a fond remembrance of the past.

Yours gratefully

J.F. Janning

1926年9月10日 スコフィールドよりジャニングへ

Dear Mr. Janning:

I am receipt of yours of the 5th, enclosing Shimadzu's estimate (which I now return). I very much regret that owing to the hard times I am unable to donate the required amount. However, it seems to me that some of the apparatus could easily be improvised to meet the requirements, from what you already have, for instance you could have watch glasses silvered at the cost of a few sen, for convex and concave mirrors. Again for the demonstration of a bell in vacuo you only need a small alarm clock to put under the bell of your air pump receiver, etc, etc. The improvisation of apparatus for such experiments also affords an excellent opportunity for your pupils to exercise their mechanical ingenuity. Besides Shimadzu is about the dearest source in Japan that you could buy from, and if you are going to order special apparatus for each experiment, you will spend a small fortune before you get through. Altogether, I am rather surprised at the prodigality exhibited in the estimate. I bought quite a lot of stuff myself from Shimadzu when I started, but soon got wise to the expedient of improvisation.

If you need precision instruments, I would suggest your writing to C. Baker, High

Holborn, London, for their periodical catalogue of Second-Hand Instruments, which will enable you at times to make purchases of really good instruments at one-half or one-third actual cost. This is how I got my 8 1/2" Calver Reflector.

With kind regards, and wishing your excellent institution continued success,

Yours sincerely,

RS:SI.

1926年9月12日 ジャニングよりスコフィールドへ (手書き)

Dear Mr. Schofield:

I fully note what you say in your letter of Sept. 10 – and have written to London for Baker's catalog.

In my little workshop there has been quite a few apparatus made even at present work is being carried on to make a photographic apparatus. Too much dependence on the boy's assistance sometimes cost more than a new apparatus — much depends however on the nature of the apparatus & the skill of the boy. Again the program to be covered in one school year leaves little time for a boy to tinker about.

What you say about Shimazu being steep in prices I know, but the catalog, I have from America were worse, so you see where I stood for choice of getting an estimate for apparatus.

Thanking you again Mr. Schofield, for what you have done for us.

I am, yours gratefully,

J.F. Janning

?年1月30日

Dear Schofield

Knowing your peuchaul for electricity which although latent is I trust still available. The knowledge still retained in your .

Such being so I can for a little information which I have sure you would be able to impart to me for better than anyone in Kobe. I the matter on which I desire par .

At present on my bus I am using a Yuasa 6 volt 120 amp. battery which seems to give out rather too soon, of course this may be due the dynamo not charging sufficiently, as the ammeter shows between 3 or 6 amps charge during most of the running, it should not lower amp of battery so quitly. Sad battery was new last March. That's that.

The principal power I want to get at as the following.

Im my English volunmes. "The Modern Moter Engineers" I just the following information which I am to regard as being correct: -

Eseed Battery

Full charge	:	Sp. G	1.245 to 1.250
Half discharged	:	— "—	1.180
Completely discharged	:	— "—	1.110

Kingstone Battery

First acid solution		Sp. G	1.285
Full charge		— "—	1.300
Half "		— "—	1.255
Discharged		— "—	1.165

Question ? Are Yuasa batterys Exede or Kingstone

Now I refer to the American Moter Manual which states as follows.

Full charge	Voltage	2.2	Sp. Gr.	1.245
Half -		2.0		1.225
Discharged		1.8		1.200

There is as you see considerable difference in the figures quoted & it matter it may misleading to me, which is your opinion to the correct table to work by, I understand it as just as bad to have battery overcharged as to seen it half charged only, therefore I wont to answer at the safest & most efficient figures.

Any information you can give me regarding the keeping of battery in just class efficiency will be appreciated, I talk all can as your as I know, that is to say, keep places well covered, terminals properly cleansed when reuires and so on.

Let me have answer as soon as you can there a good chap I shall esteem it a great favour.

Cheers, have the New Year shall

be a successful one for you

Yours H.P. Rugg

1930 年 1 月 14 日 スコフィールドよりラグへ

Dear Rugg:

Replying to your letter enquiring with regard to Lead Storage Batteries, -- I gave

up my electrical laboratory sometime ago, as I found it beyond my means, and am now confining my spare time to observational Astronomy. Some of my drawings of Mars were included and commented upon by Prof. W.H. Pickering.

On referring to my electrical textbooks, I find that the data as quoted by you from the "American Motor Manual" is substantially correct, but as makers specifications vary somewhat for heavy duty batteries I suggest that you apply to the dealer from whom you purchased the battery, or from Yuasa's direct, for the directions which invariably accompany such apparatus. So far as I know, Yuasa's batteries are well known and reputed to be pretty reliable. All lead batteries are liable to trouble, and particular care must be exercised to see that the polarity is not reversed when charging, as this is sufficient to ruin a battery.

I purchased a lead battery some years ago (not Yuasa's, as far as I can remember) for energizing my induction coil for spectroscopic work, but I had so much trouble with it that I relegated it to the lumber room and invested in an Edison, which as you know is fool-proof. I worked with this for quite a while without any trouble whatever.

As a general rule, however, owing to the improvement in the manufacture of lead batteries for heavy duty, they give little or no trouble when properly handled and cared for.

Reciprocating your good wishes for the New Year, and with kind regards,

I remain,

Yours sincerely,